CLAIMS

What is claimed is:

1. An automated liquid dispenser for dispensing a liquid into an open-top container, comprising:

a housing defining a dispensing zone for receiving the open-top of the container;

a liquid dispensing spout extending from the housing and above the dispensing zone for dispensing liquid into the container;

first and second reflector arrays disposed on opposite sides of the dispensing zone such that the open-top container is between the first and second arrays when the open-top container is received within the dispensing zone, and each reflector array comprising multiple vertically-spaced reflectors, with a reflector on the first array being paired with a reflector on the second array;

an emitter mounted in a position to emit a signal onto the multiple reflectors of the first reflector array for reflection across the dispensing zone and onto the corresponding paired reflectors of the second array;

a receiver mounted in a position to receive the emitted signal reflected from the reflectors of the second array and generate a container height signal;

a liquid level sensor for determining the liquid level in the container and generating a liquid level signal; and

a controller coupled to the receiver and the liquid level sensor for controlling the filling of the liquid into the container based on the received container height signal and the liquid level signal.

2. The automated liquid dispenser of claim 1, wherein the first and second reflector arrays are removably mounted to the housing.

3. The automated liquid dispenser of claim 2, wherein the first reflector array is carried by a first panel and the second reflector array is carried by a second panel, wherein the first and second panels are removably coupled to the housing.

4. The automated liquid dispenser of claim 3, wherein the reflectors are integrally formed with the panels.

5. The automated liquid dispenser of claim 4, wherein the reflectors are made from a thermal plastic.

6. The automated liquid dispenser of claim 1, wherein the reflectors are disposed at a predetermined angle relative to a plane orthogonal to the emitted signal such that the emitted signal is reflected from the reflectors of the first array, across the dispensing zone, onto the paired reflectors of the second array, and then onto the receiver.

7. The automated liquid dispenser of claim 6, wherein the predetermined angle for the reflectors of the first array is 45-degrees relative to a plane orthogonal to the emitted signal.

8. The automated liquid dispenser of claim 7, wherein the predetermined angle for the reflectors of the second array is -45 degrees relative to a plane orthogonal to the emitted signal.

9. The automated liquid dispenser of claim 1, wherein the reflectors in each array are arranged in a step configuration with a vertical offset and a lateral offset between adjacent reflectors.

10. The automated liquid dispenser of claim 9, wherein the vertical offset is between 0.75 and 2 inches.

11. The automated liquid dispenser of claim 10, wherein the lateral offset is .25 to 1.00 inches.

12. The automated liquid dispenser of claim 1, wherein the reflectors are composed of a thermal plastic.

13. The automated liquid dispenser of claim 1, wherein the liquid level sensor is a wide bandwidth transducer.

14. The automated liquid dispenser of claim 13, wherein the liquid level sensor is a piezo film.

15. The automated liquid dispenser of claim 13, wherein the liquid level sensor is a micro-electro-mechanical system (MEMS).

16. The automated liquid dispenser of claim 1, wherein the container height signal is composite signal of all the signals reflected across the dispensing zone and not blocked by the open-top container.

17. A refrigerator in combination with a liquid dispenser for dispensing a liquid into an open-top container, the refrigerator comprising:

a cabinet having at least one refrigerated compartment with an open face;

a door movably mounted to the refrigerated compartment for movement between a closed position, where the door covers the open face, and an open position, where the door is withdrawn from the open face;

the liquid dispenser comprising:

a housing located in a recess in the door and defining a dispensing zone for receiving the open-top of the container;

a liquid dispensing spout extending from the housing and above the dispensing zone for dispensing liquid into the container;

first and second reflector arrays disposed on opposite sides of the dispensing zone such that the open-top container is between the first and second arrays when the open-top container is received within the dispensing zone, and each reflector array comprising multiple vertically-spaced reflectors, with a reflector on the first array being paired with a reflector on the second array;

an emitter mounted in a position to emit a signal onto the multiple reflectors of the first reflector array for reflection across the dispensing zone and onto the corresponding paired reflectors of the second array;

a receiver mounted in a position to receive the emitted signal reflected from the reflectors of the second array and generate a container height signal;

a liquid level sensor for determining the liquid level in the container and generating a liquid level signal; and

a controller coupled to the receiver and the liquid level sensor for controlling the filling of the liquid into the container based on the received container height signal and the liquid level signal.

18. The combination of claim 17, wherein the first and second reflector arrays are removably mounted to the housing.

19. The combination of claim 18, wherein the first reflector array is carried by a first panel and the second reflector array is carried by a second panel, wherein the first and second panels are removably coupled to the housing.

20. The combination of claim 19, wherein the housing comprises opposing sides, with each side having a channel, and the panels are received within the channels to mount the panels to the housing.

21. The combination of claim 20, wherein the housing comprises an upper wall spanning the side walls, and the emitter, receiver, and liquid level sensor are mounted to the upper wall.

22. The combination of claim 21, wherein the dispensing spout extends through the upper wall.

23. The combination of claim 19, wherein the reflectors are integrally formed with the panels.

24. The combination of claim 1, wherein the reflectors are made from a thermal plastic.

25. The combination of claim 1, wherein the reflectors are disposed at a predetermined angle relative to a plane orthogonal to the emitted signal such that the emitted signal is reflected from the reflectors of the first array, across the dispensing zone, onto the paired reflectors of the second array, and then onto the receiver.

26. The combination of claim 25, wherein the predetermined angle for the reflectors of the first array is 45 degrees relative to a plane orthogonal to the emitted signal.

27. The combination of claim 26, wherein the predetermined angle for the reflectors of the second array is -45 degrees relative to a plane orthogonal to the emitted signal.

28. The combination of claim 17, wherein the reflectors in each array are arranged in a step configuration with a vertical offset and a lateral offset between adjacent reflectors.

29. The combination of claim 28, wherein the vertical offset is between 0.75 and 2 inches.

30. The combination of claim 29, wherein the lateral offset is .25 to 1.00 inches.

31. The combination of claim 17, wherein the liquid level sensor is a wide bandwidth transducer.

32. The combination of claim 31, wherein the liquid level sensor is a piezo film.

33. The combination of claim 17, wherein the liquid level sensor is a micro-electro-mechanical system (MEMS).

34. The combination of claim 17, wherein the container height signal is composite signal of all the signals reflected across the dispensing zone and not blocked by the open-top container.